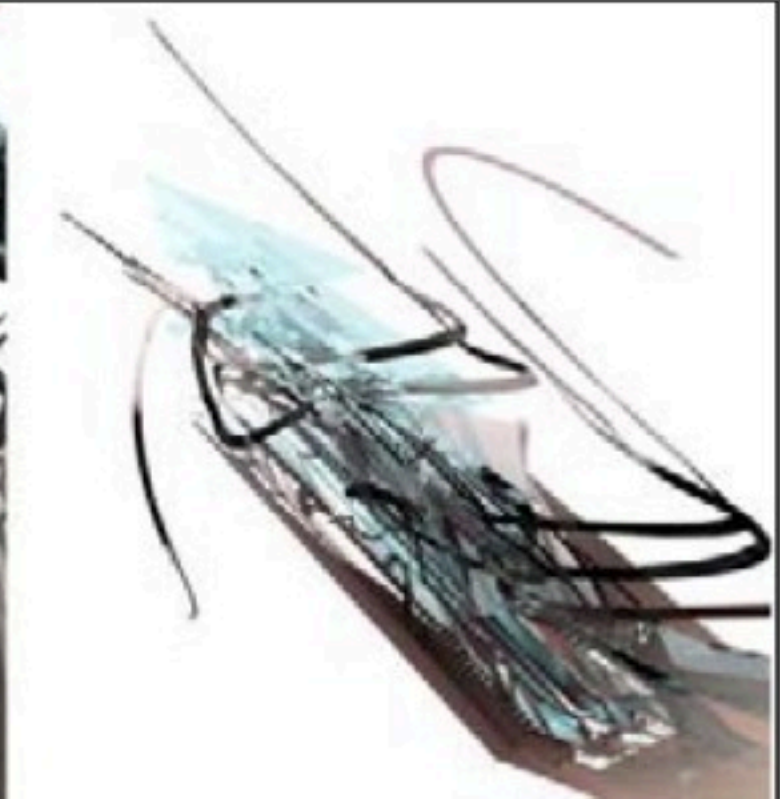


Mesh_6
Mesh_5
Mesh_4
Mesh_3
Mesh_2
Mesh_1



BERPIKIR PERANCANGAN

DESIGN THINKING

WEEK 5 DESIGN PROBLEMS # 2

BERPIKIR PERANCANGAN

DESIGN THINKING

- 1. Masalah Disain**
- 2. Menstrukturkan Masalah Disain**
- 3. Disain / Riset sebagai Penyelesaian Masalah**

MASALAH DISAIN

DESIGN PROBLEMS

MASALAH

PROBLEMS

Tame problem: Tame problems may be quite complex, but they lend themselves to analysis and solution by known techniques. A traditional linear process is sufficient to produce a workable solution to a tame problem in an acceptable period of time, and it is clear when a solution has been reached.

A wicked problem defies any standard attempt to find a solution because it is a symptom or result of multiple, contingent, and conflicting issues. Environmental degradation, social and economic inequity, and terrorism are some of the classic wicked problems that we face in the twenty-first century.

Rittel, H., and M. M. Webber. 1973. Dilemmas in a general theory of planning. *Policy Sciences* 4:155–69.

Rittel, W.J. and Webber, M.M. (1973) Planning Problems are Wicked Problems, In Cross, N. *Developments in Design Methodology*, Chichester: Wiley.

WICKED PROBLEM

(1) There is no definitive formulation of a wicked problem. Formulating the problem and the solution are essentially the same thing. Each attempt at creating a solution changes the understanding of the problem.

(2) Wicked problems have no stopping rule. Since you cannot define the problem, it is difficult to tell when it is resolved. The problem solving process ends when resources are depleted, stakeholders loose interest or political realities change.

(3) Solutions to wicked problems are not true-or-false but good-or-bad.

Since there are no unambiguous criteria for deciding if the problem is resolved, getting all stakeholders to agree that a resolution is 'good enough' can be a challenge.

WICKED PROBLEM

(4) There is no immediate and no ultimate test of a solution to a wicked problem.

Solutions to wicked problems generate waves of consequences, and it is impossible to know how all of the consequences will eventually play out.

(5) Every implemented solution to a wicked problem has consequences. Once the web site is published or the new customer service package goes live, you can't take back what was on-line or revert to the former customer database.

(6) Wicked problems do not have a well-described set of potential solutions.

Various stakeholders will have differing views of acceptable solutions. It is a matter of judgment as to when enough potential solutions have emerged and which should be pursued.

WICKED PROBLEM

(7) Every wicked problem is essentially unique.

There are no 'classes' of solutions that can be applied to a specific case. "Part of the art of dealing with wicked problems is the art of not knowing too early what type of solution to apply." I

(8) Every wicked problem can be considered a symptom of another problem.

A wicked problem is a set of interlocking issues and constraints which change over time, embedded in a dynamic social context.

(9) The causes of a wicked problem can be explained in numerous ways.

There are many stakeholders who will have various and changing ideas about what might be a problem, what might be causing it, and how to resolve it.

(10) The planner (designer) has no right to be wrong.

A scientist is expected to formulate hypothesis, which may or may not be supportable by evidence. A designer doesn't have such a luxury, they are expected to get things right.

ILL-DEFINED PROBLEMS

1. There is no definitive formulation of the problem. When the problem is initially set, the goals are usually vague, and many constraints and criteria are unknown. The problem context is often complex and messy, and poorly understood. In the course of problem-solving, temporary formulations of the problem may be fixed, but these are unstable and can change as more information becomes available.

2. Any problem formulation may embody inconsistencies. The problem is unlikely to be internally consistent; many conflicts and inconsistencies have to be resolved in the solution. Often, inconsistencies emerge only in the process of problem-solving.

ILL-DEFINED PROBLEMS

3. Formulations of the problem are solution-dependent. Ways of formulating the problem are dependent upon ways of solving it; it is difficult to formulate a problem statement without implicitly or explicitly referring to a solution concept. The way the solution is conceived influences the way the problem is conceived.

4. Proposing solutions is a means of understanding the problem. Many assumptions about the problem and specific areas of uncertainty can be exposed only by proposing solution concepts. Many constraints and criteria emerge as a result of evaluating solution proposals.

5. There is no definitive solution to the problem. Different solutions can be equally valid responses to the initial problem. There is no objective true-or-false evaluation of a solution; but solutions are assessed as good or bad, appropriate or inappropriate.

Nigel Cross (2008) Engineering Design Methods, John Wiley&Sons, 4th edition hal. 13-4

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PENDEKATAN TERHADAP MASALAH

DESIGN THINKING

The “black box” approach concerns the creativity and mystery of design. It sees design as an abstract process that occurs in the mind of any given designer. As such, design cannot be analyzed, but techniques such as brainstorming and the application of synetics are helpful in visualizing the design process.

The “glass box” approach analyzes design based on its logical process and decision sequence. The design process is a sequence of events, which includes identification, analysis, synthesis, and evaluation.

MASALAH DISAIN

DESIGN PROBLEMS

- ▶ Tak dapat dinyatakan secara komprehensif.
- ▶ Sering dipenuhi ketidakpastian, tujuan dan prioritas adalah relatif.
- ▶ Masalah disain tidak statis!
- ▶ Memerlukan penafsiran subjektif. Tidak ada formulasi masalah disain yang sepenuhnya objektif.
- ▶ Cenderung diorganisir secara hierarkhis.
- ▶ Tidak ada cara yang objektif atau logis dalam menentukan level yang tepat di mana kita akan menangani masalah disain.
- ▶ Setiap keputusan biasanya bersifat pragmatis (tergantung waktu, biaya dan sumber daya yang tersedia bagi disainer).

SOLUSI DISAIN

DESIGN SOLUTIONS

- ▶ Tak dapat dibatasi jumlahnya!
- ▶ Tidak ada solusi optimal atas masalah disain. Selalu merupakan kompromi
- ▶ Tidak ada metoda pengukuran yang kukuh untuk mengevaluasi disain
- ▶ Solusi disain tak akan pernah sempurna, lebih mudah dikritik ketimbang menciptakannya

PROSES DISAIN

DESIGN PROCESS

- ▶ Proses yang tidak akan pernah berakhir!
- ▶ Tidak ada proses yang tepat dan bebas kesalahan.
- ▶ Proses melibatkan penemuan sekaligus pemecahan masalah.
- ▶ Solusi dan masalah bukan proses yang linier tetapi bersifat argumentatif.
- ▶ Penemuan masalah dan solusi bukan sebuah kegiatan yang didominasi oleh logika namun melibatkan pemikiran kreatif di level yang tinggi.
- ▶ Pasti melibatkan penilaian mutu yang subjektif!
- ▶ Sains mendiskripsikan, disain adalah anjuran.

PROSES DISAIN

DESIGN PROCESS

- ▶ Sains: menangani masalah apa yang ada, mencari tahu bagaimana dan mengapa. Disain menangani masalah yang mungkin, dapat dan seharusnya.
- ▶ Sains meramalkan masa depan, disain mereseapkan dan menciptakan masa depan.
- ▶ Disainer bekerja dalam konteks perlunya tindakan yaitu mengubah lingkungan.
- ▶ Seniman bebas berfokus pada isu yang menarik, disainer tidak tidak bisa bebas!
- ▶ Ilmuwan dapat berbuat salah dan dapat saja tetap memajukan sains. Disainer sulit diakui adanya kontribusi dari sebuah disain yang salah!

PENGUKURAN DALAM DISAIN

- ▶ Proses disain yang baik bukan akhir tetapi sebuah langkah menuju sebuah disain yang baik.
- ▶ Akan tetapi: tujuan akhir bukan proses itu tetapi solusinya!
- ▶ Bagaimana mengukur tingkat keberhasilan sebuah solusi disain?
- ▶ Diperlukan pemahaman terhadap skala!

PENGUKURAN DALAM DISAIN

SKALA NOMINAL. Membedakan satu kategori dengan kategori lainnya. Contoh: jenis kelamin, agama, ruang (interior, eksterior).

SKALA ORDINAL. Seperti skala nominal tetapi dapat menunjukkan urutan kategorinya. Contoh: variabel "kenyamanan" yang dapat diurai menjadi 3 kategori: sangat nyaman, nyaman, tidak nyaman.

SKALA INTERVAL. Interval satu kategori dengan yang lain dapat diketahui. Contoh: variabel "suhu ruang" yang mempunyai skala dari -100, hingga 100 derajat Celcius. Tetapi 0 derajat merupakan nilai yang tetap "ada" dalam skala.

SKALA RASIO. Memiliki nilai absolut "tidak ada" yaitu 0. Variabel "biaya" misalnya memiliki Rp. 0, 00 yang berarti tidak ada biaya.

Usaha untuk mereduksi semua faktor [pemberian penilaian subjektif dalam situasi di mana faktor kualitatif dan kuantitatif harus diperhitungkan] menjadi sebuah sistem pengukuran kuantitatif yang lazim seperti nilai moneter hanya akan memindahkannya menjadi masalah pemberian nilai.
(Lawson, 2008: 91)

REFERENSI UTAMA

REFERENCE

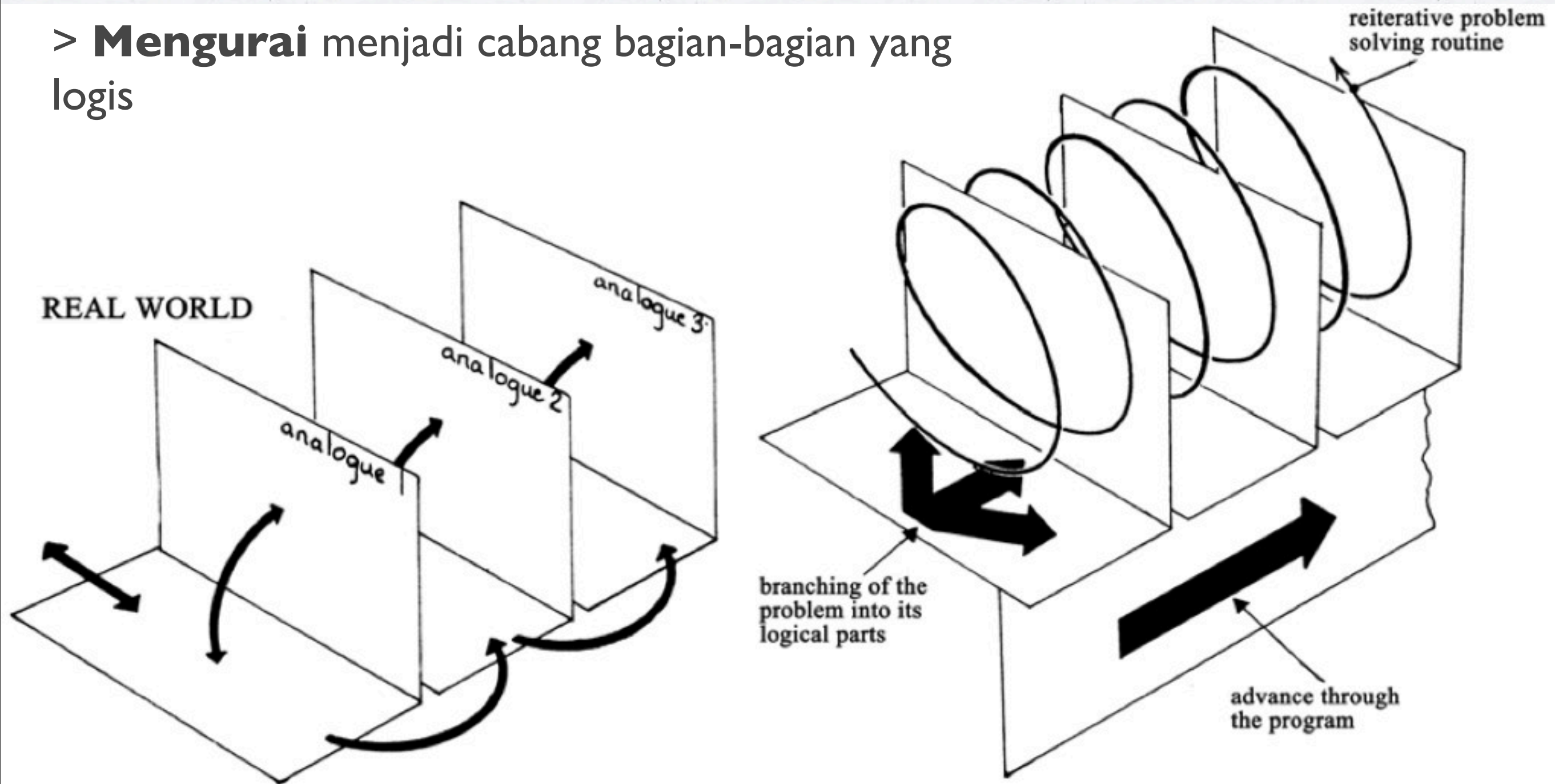
Lawson, B. *Bagaimana Cara Berpikir Disainer*, terjemahan dari *How Designer Think*, The Architectural Ltd. 1980, Yogyakarta, Jalasutra, 2007

MENSTRUKTURKAN MASALAH DISAIN

STRUCTURING DESIGN PROBLEM

MENSTRUKTURKAN MASALAH DISAIN

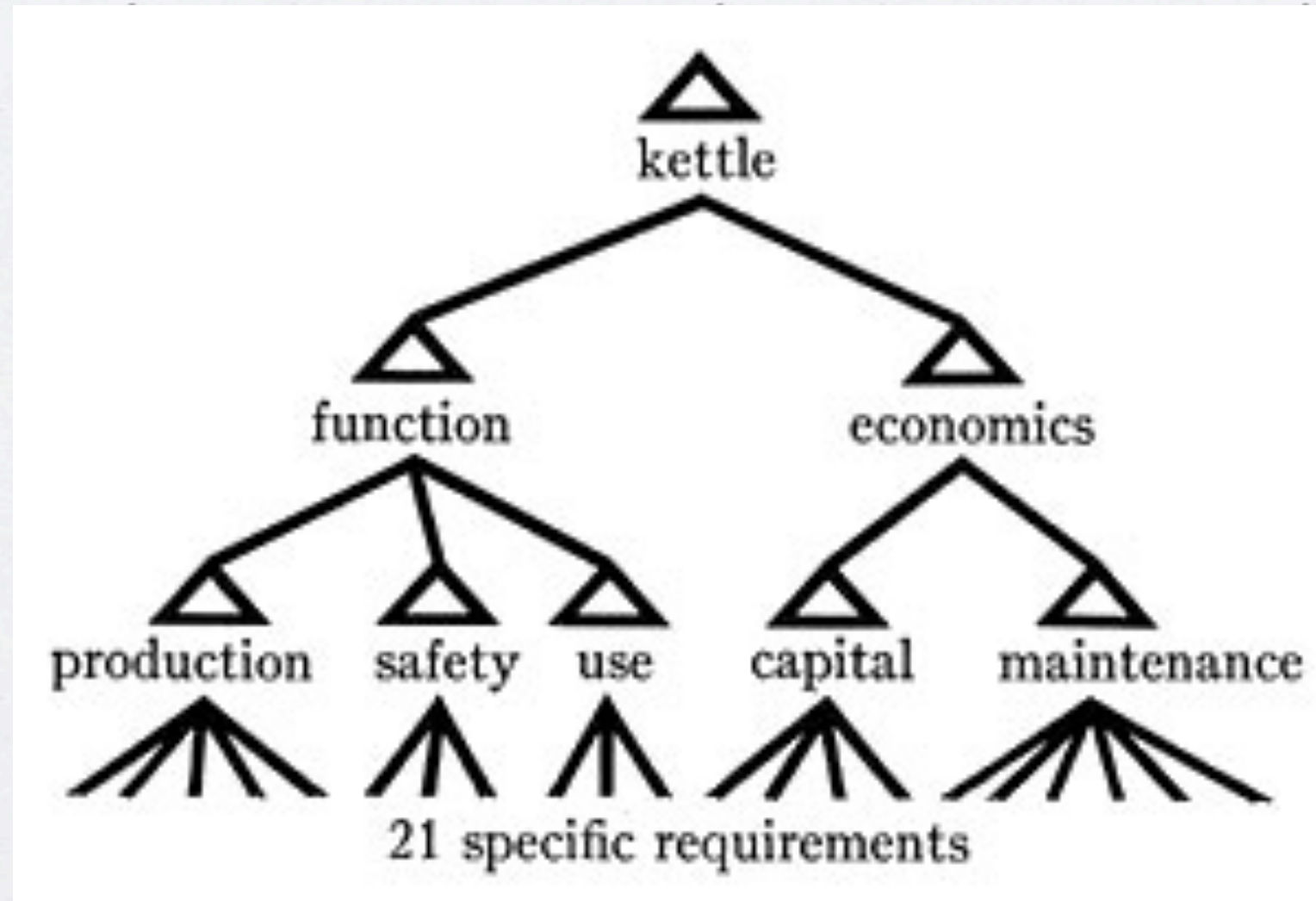
> **Mengurai** menjadi cabang bagian-bagian yang logis



Design process, branching (Archer, 1969, p.94 and p.100)

MENSTRUKTURKAN MASALAH DISAIN

> **Mengurai** (*decompose*) menjadi bagian-bagian yang sepenuhnya independen



Design is the process of inventing things which display new physical order, organization, form, in response to function...

Christopher Alexander, 1964 *Notes on the Synthesis Of Form*

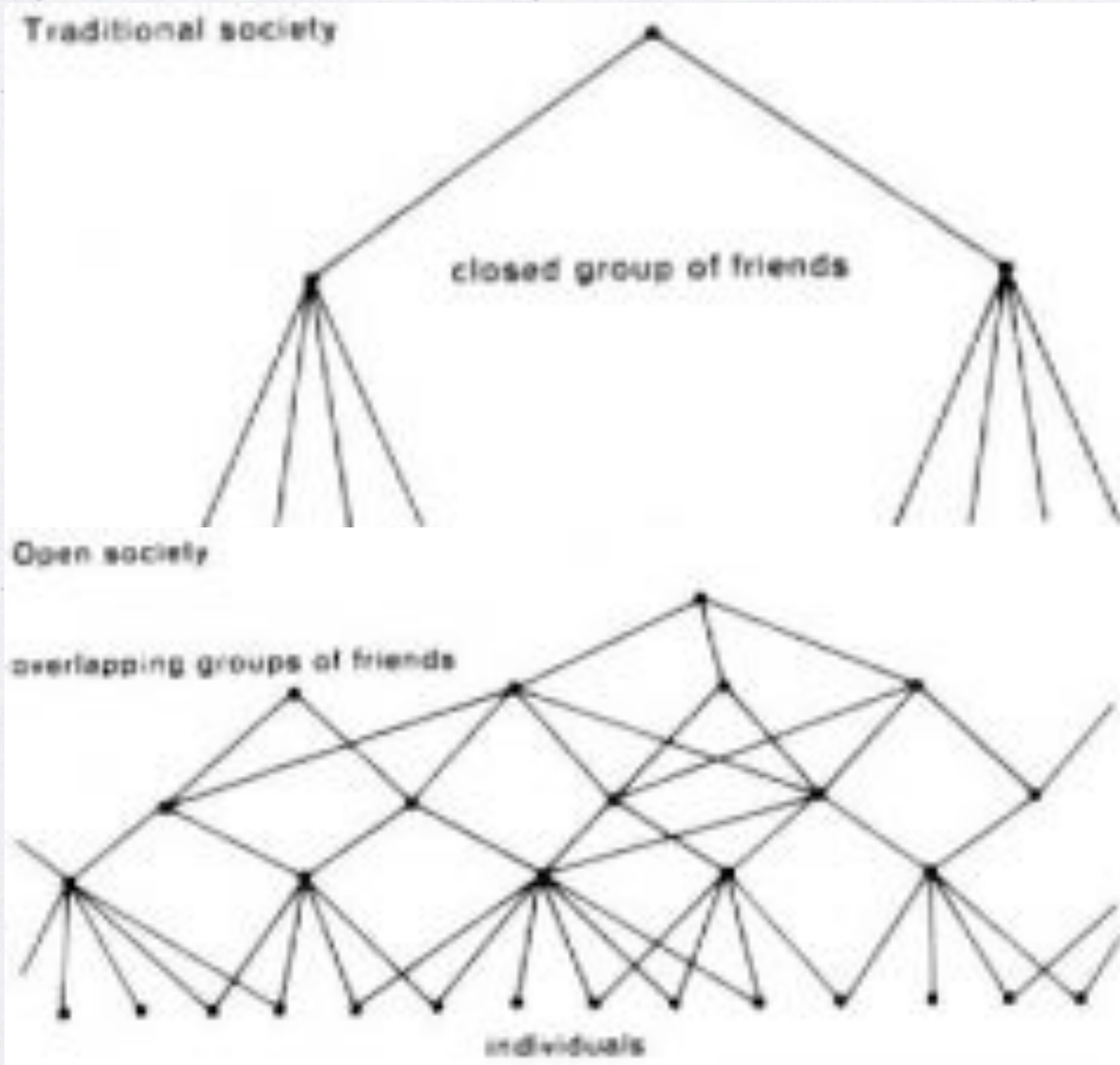
<http://www.rudi.net/books/201>

MENSTRUKTURKAN MASALAH DISAIN



Christopher Alexander, 1964 *Notes on the Synthesis Of Form*

MENSTRUKTURKAN MASALAH DISAIN



> **Mengurai** menjadi bagian-bagian yang logis namun tetap memperhatikan kaitan antar satu dengan lainnya - tidak independen - namun kompleks: sebuah struktur yang *lattice*

Christopher Alexander, 1966, *A City is not a Tree*

Architectural Forum, Vol 122, No 1, April 1965, pp 58-62 (Part I),

Vol 122, No 2, May 1965, pp 58-62 (Part II)

Design, No 206, February 1966, pp46-55

Ekistics, Vol 23, pp 344 - 348, June 1967

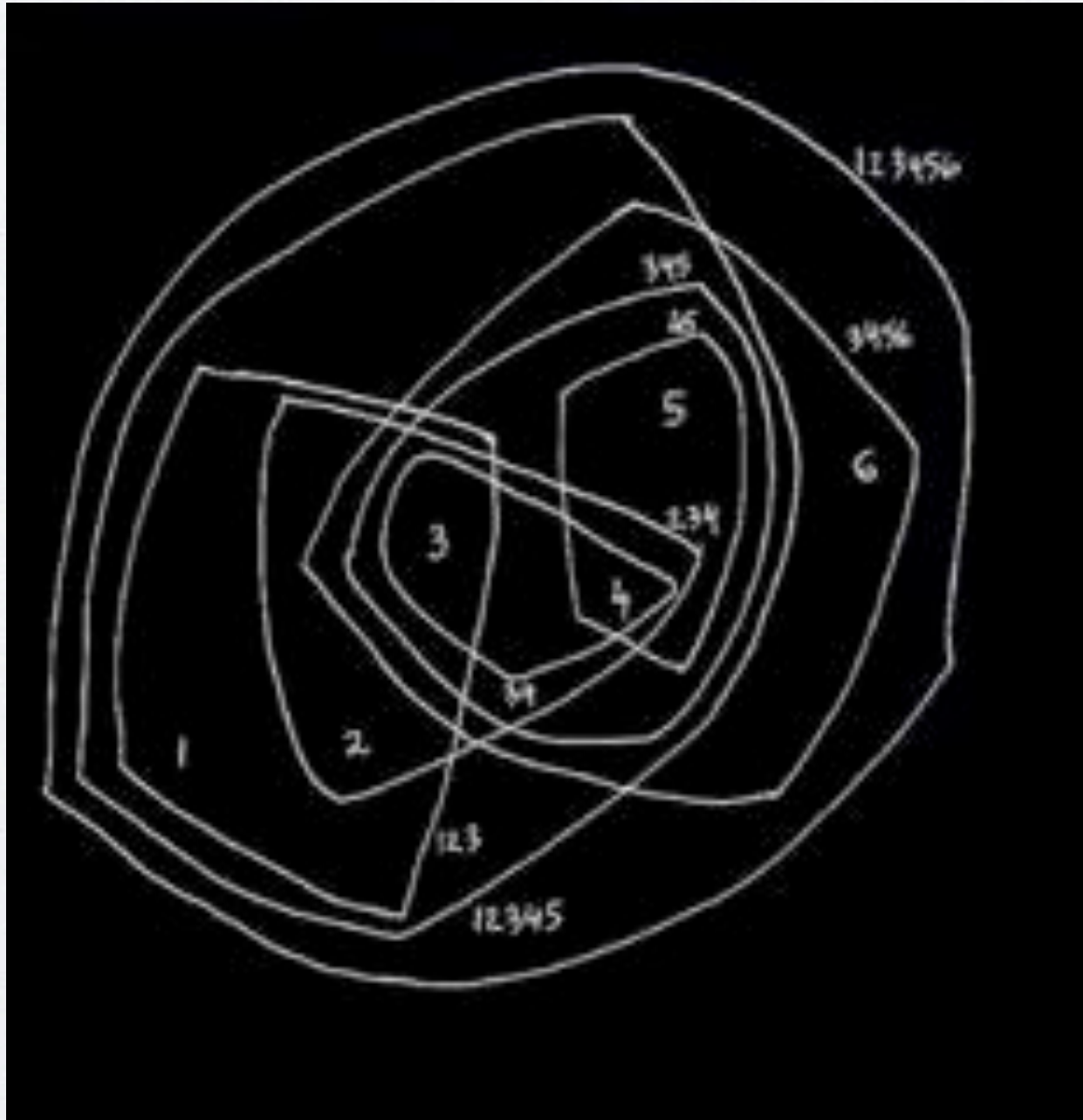
Bell, G & Tyrwhitt, J(eds) *Human Identity in the Urban Environment*, Harmondsworth, UK, Penguin Books, 1972

Thackara, J. (ed.) (1988), *Design After Modernism: Beyond the Object*, Thames and Hudson, London, pp. 67-84.

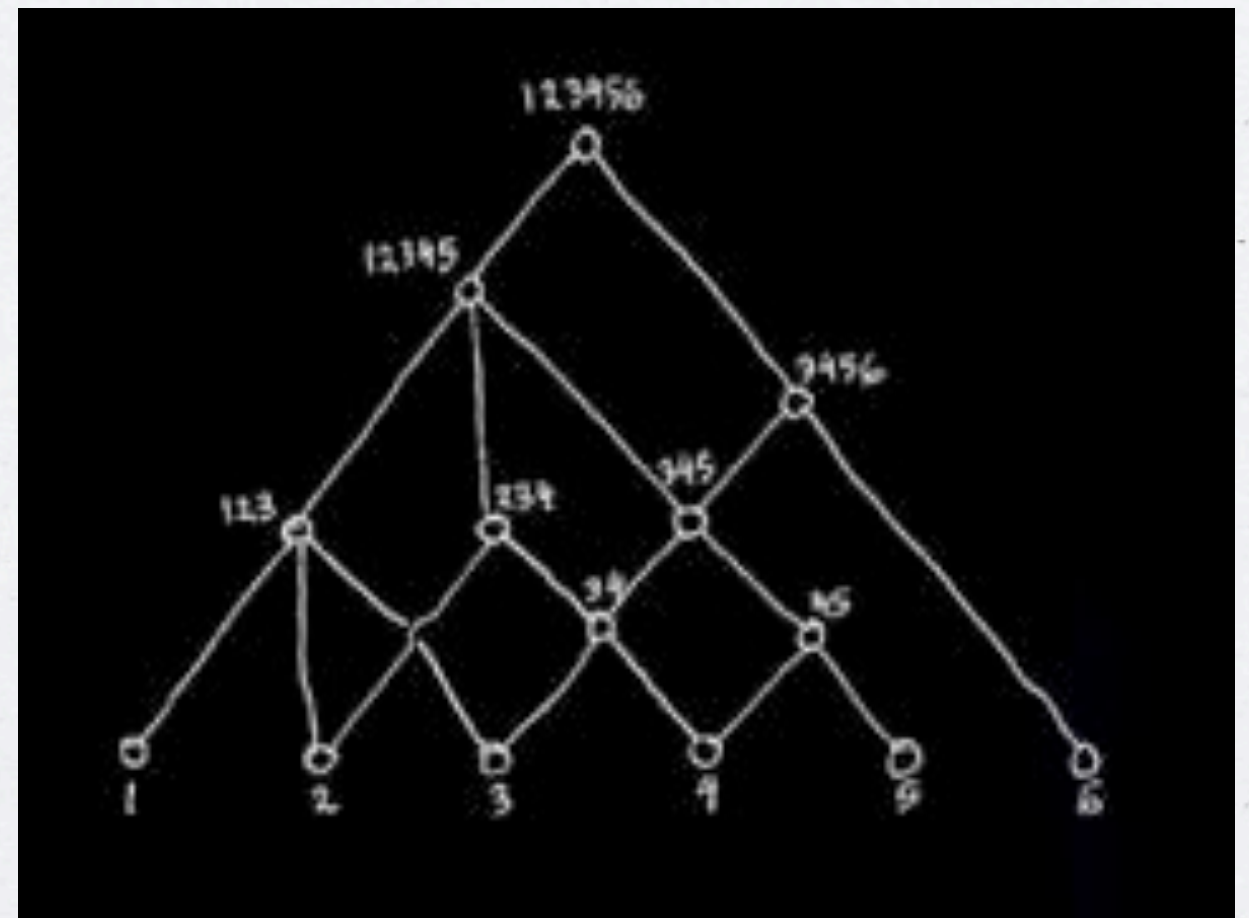
<http://www.rudi.net/books/201>

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MENSTRUKTURKAN MASALAH DISAIN



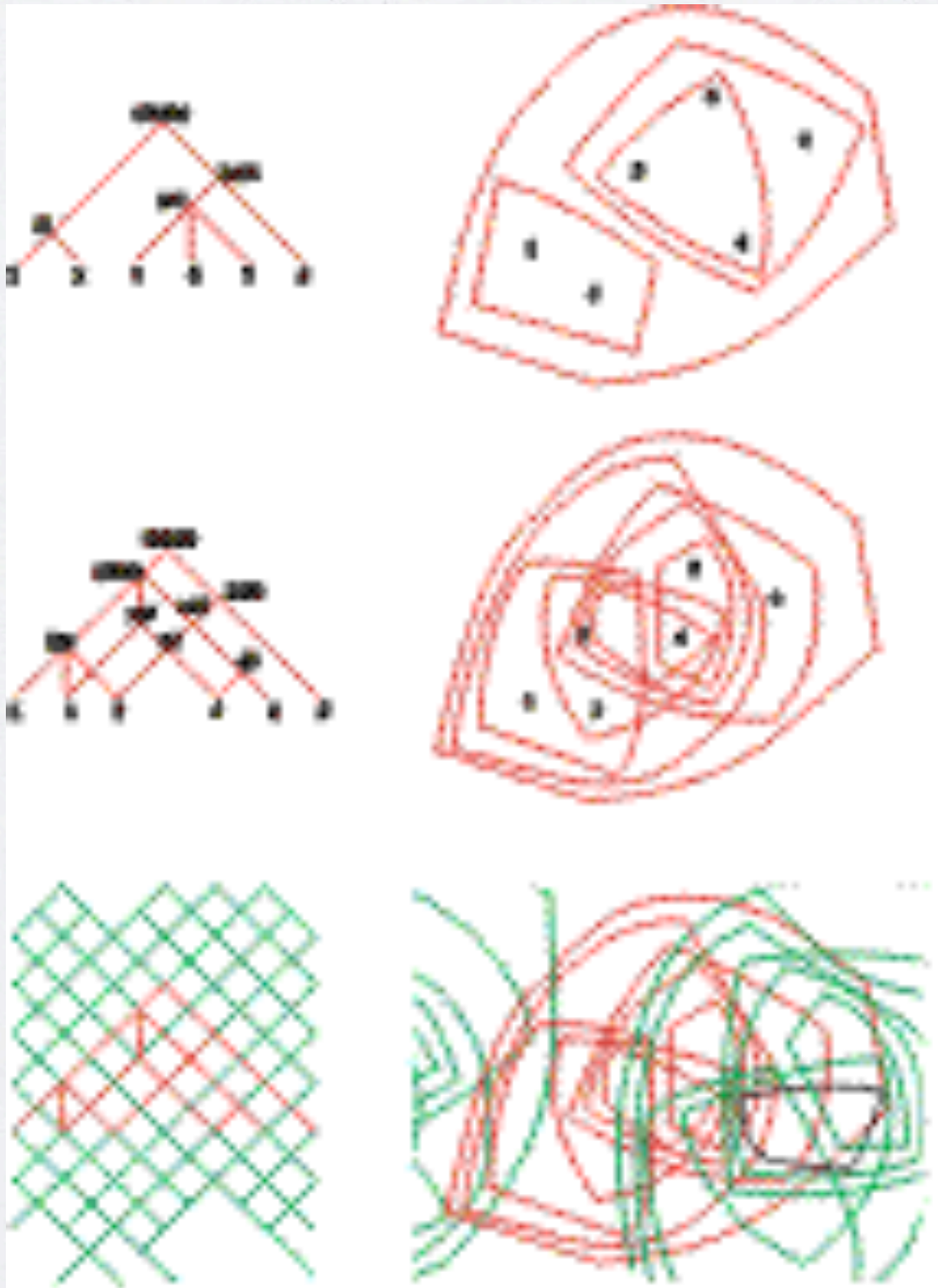
Christopher Alexander, *City is not a Tree*



<http://www.rudi.net/pages/8755>

MENSTRUKTURKAN MASALAH DISAIN

**Christopher Alexander,
1977, Pattern Language**



<http://www.rudi.net/pages/8755>

MENSTRUKTURKAN MASALAH DISAIN

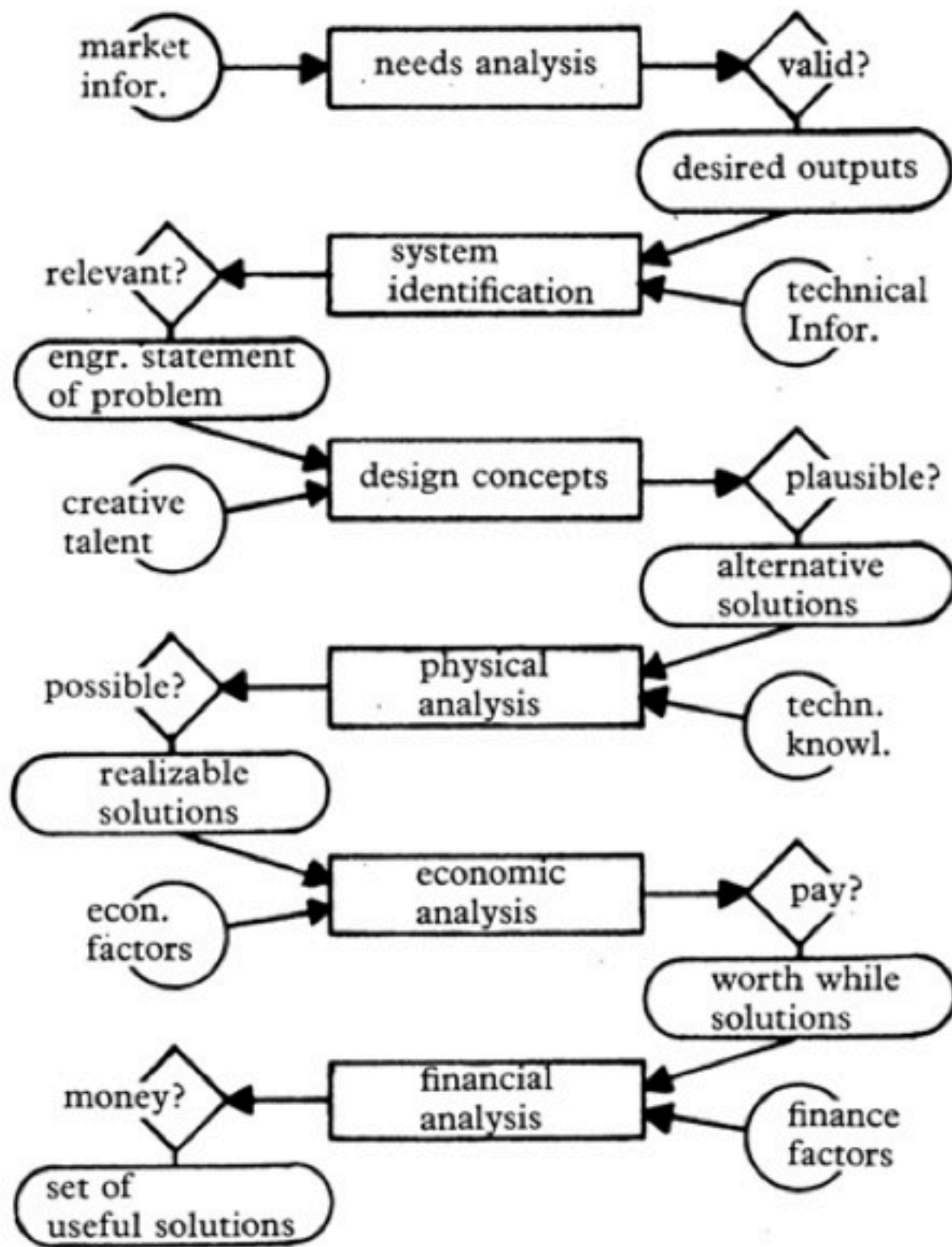
Christopher Alexander (1977) *A Pattern Language: Towns, Buildings, Construction*. Oxford University Press

A pattern is a careful description of a perennial solution to a recurring problem within a building context, describing one of the configurations which brings life to a building.

Each pattern describes a problem which occurs over and over again in our environment, and then describes the core solution to that problem, in such a way that you can use the solution a million times over, without ever doing it the same way twice.

<http://www.rudi.net/pages/8755>

MENSTRUKTURKAN MASALAH DISAIN



> **Mengurutkan** menjadi bagian-bagian yang dapat dikelompokkan dalam tahapan

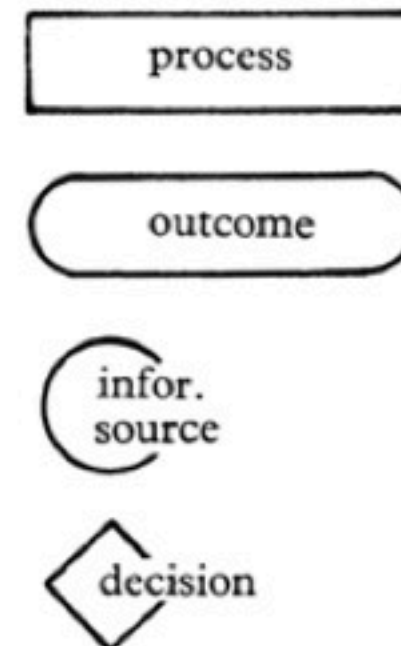
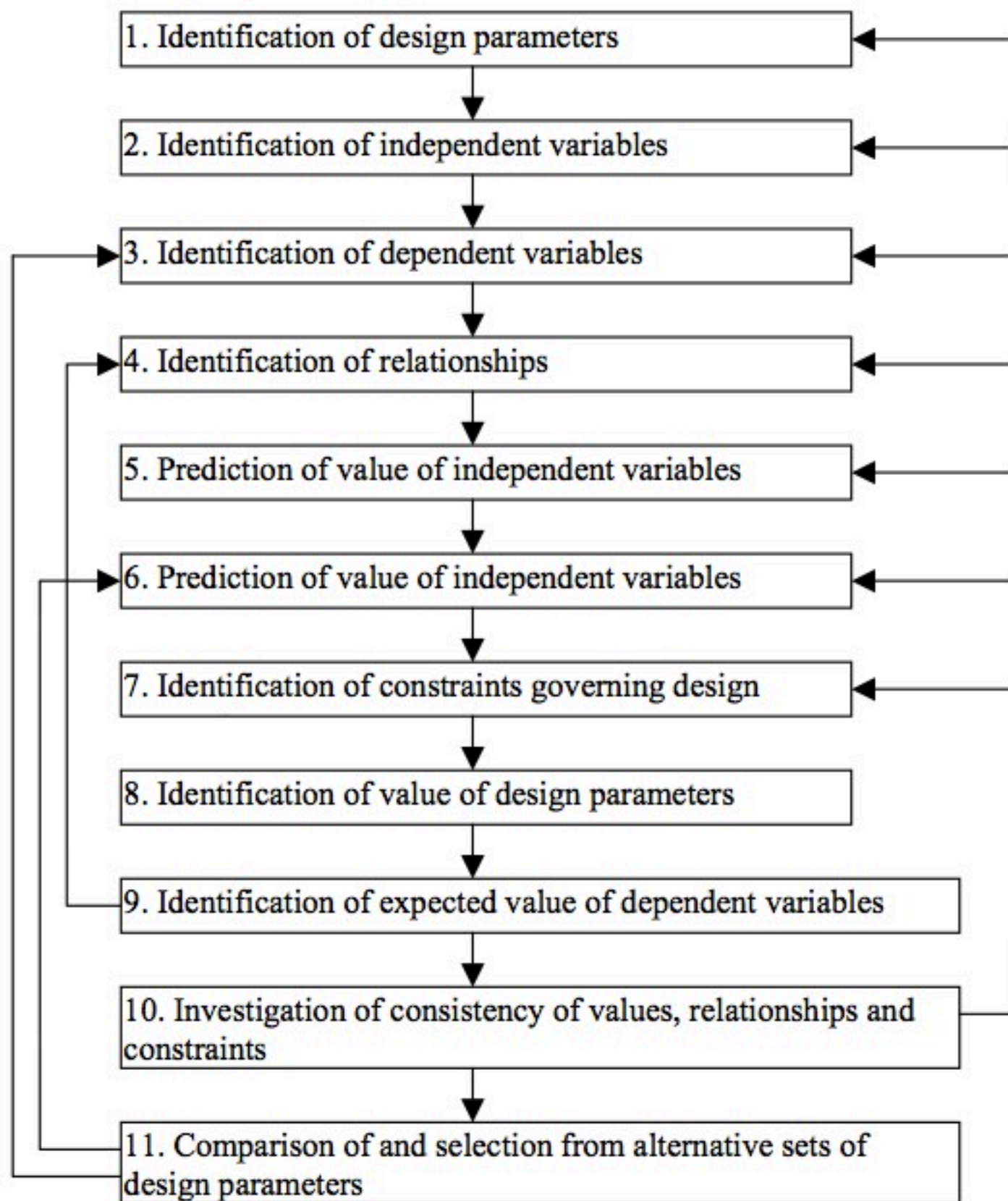


Diagram for a preliminary design (Asimow, 1962)

MENSTRUKTURKAN MASALAH DISAIN



> **Mengurutkan** menjadi bagian-bagian yang dapat dikelompokkan dalam tahapan dilengkapi dengan proses iteratif

Eleven stages in the decision sequence (Markus, 1969)

There are two distinct design structures: **a sequential process** and **an iterative process.**

MENSTRUKTURKAN MASALAH DISAIN

> **menyusun dalam matriks** yang memberikan penekanan pada kesamaan bobot antar sel / permasalahan dan pengkategorian yang ketat.

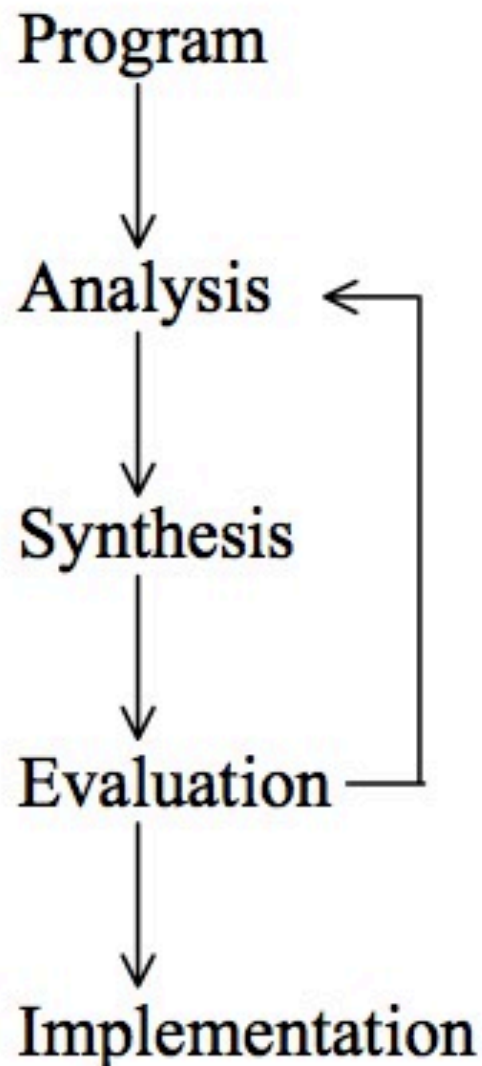
Values	(a) Existing Site Characteristics	(b) Future Site Uses	(c) Goals and Objectives
1. Environment	<ul style="list-style-type: none"> ⇒ Brownfields/Contamination ⇒ Unused industrial buildings, site, equipment ⇒ End of Federal shipping channel ⇒ Combined sewer outlets across river. ⇒ Runoff from hard surfaces. ⇒ Wasted energy from working mill. 	<ul style="list-style-type: none"> ⇒ Phytoremediation projects. ⇒ Riverbank/riparian corridor restoration. ⇒ Shipping channel improvements. ⇒ Green Building Technologies on new structures. ⇒ Green renovation of existing structures. ⇒ Demonstration site for environmental technologies. 	<ul style="list-style-type: none"> ⇒ Sustained/permanent remediation. ⇒ Habitat Restoration ⇒ Clean surface runoff/utilization of clean roof runoff. ⇒ Making techniques visible. ⇒ Use of wasted energy resources.
2. Human Comfort	<ul style="list-style-type: none"> ⇒ Low access from surroundings. ⇒ Desolate, intimidating. ⇒ No facilities. 	<ul style="list-style-type: none"> ⇒ Industrial play/exploration areas. ⇒ Outdoor areas. ⇒ Public Facilities. 	<ul style="list-style-type: none"> ⇒ Make accessible to cars, boats, [commercial and private], alternative transportation. ⇒ Make inviting-human scale, easy navigation. ⇒ Facilities for rest, comfort, recreation, entertainment, and learning.
3. Culture and Tradition	<ul style="list-style-type: none"> ⇒ Economic importance of steel mills to City. ⇒ Generator of surrounding neighborhoods ⇒ Current economic and cultural impacts ⇒ City identity ⇒ Historical/Nostalgic values, Collective memories. ⇒ Devastating impacts of mill closings [past and present] 	<ul style="list-style-type: none"> ⇒ Historical/Interpretive Center. ⇒ Tours/Restorations of Industrial Artifacts. ⇒ Rest/Camping areas for potential Towpath extension users. ⇒ Environmental center. ⇒ Educational facilities. 	<ul style="list-style-type: none"> ⇒ Transmission of cultural/collective memory. ⇒ Create showcase for environmental technologies. [greening of industry] ⇒ Education resources for local schools.

Cari rujukan pematrian penstruktural masalah dari referensi lain!

MENSTRUKTURKAN MASALAH DISAIN

> **Menberi dugaan, terkaan, tebakan - conjecture** yang dilengkapi dengan proses pengujian terkaan tersebut

Traditional Shape



Popperian Shape

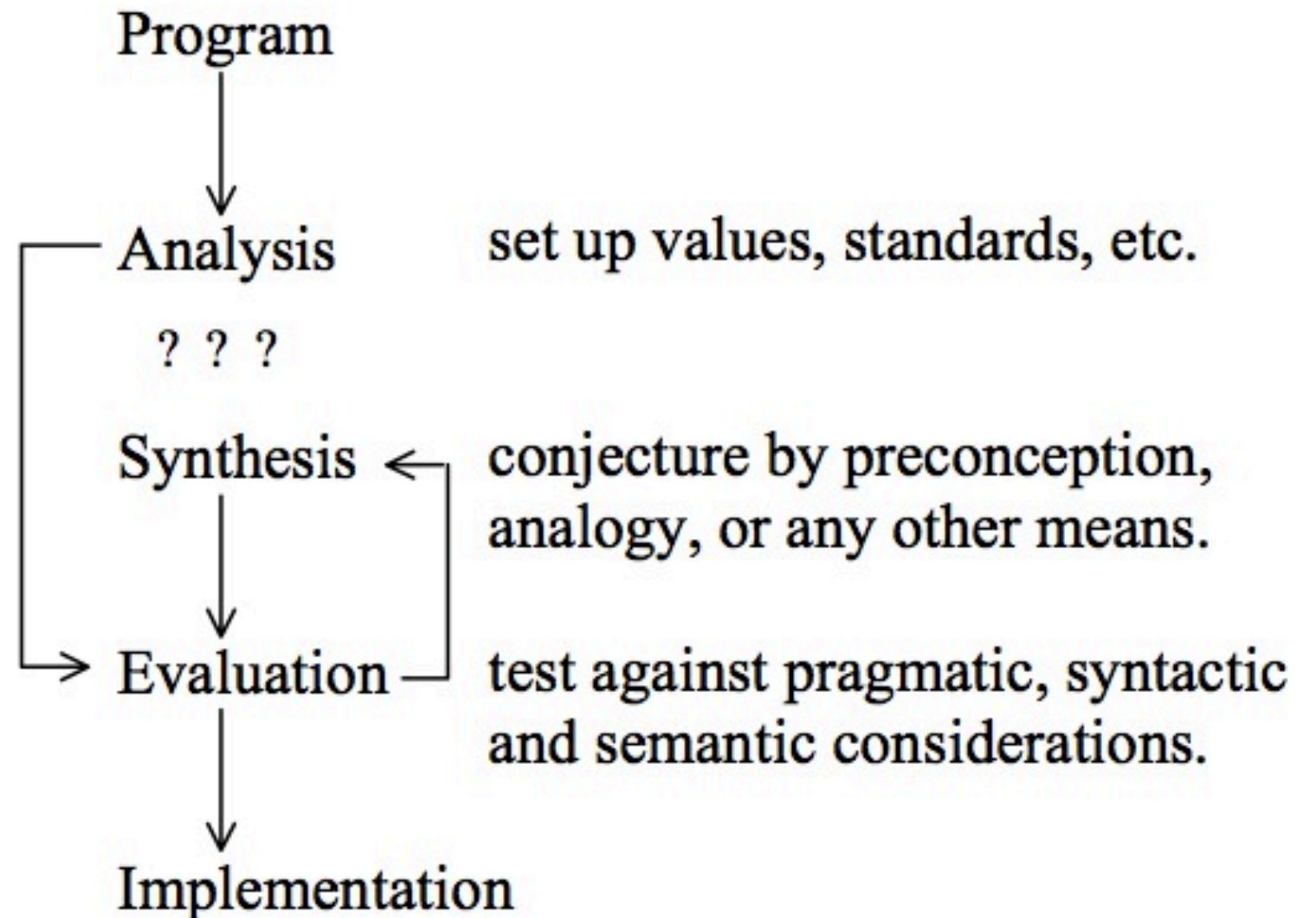
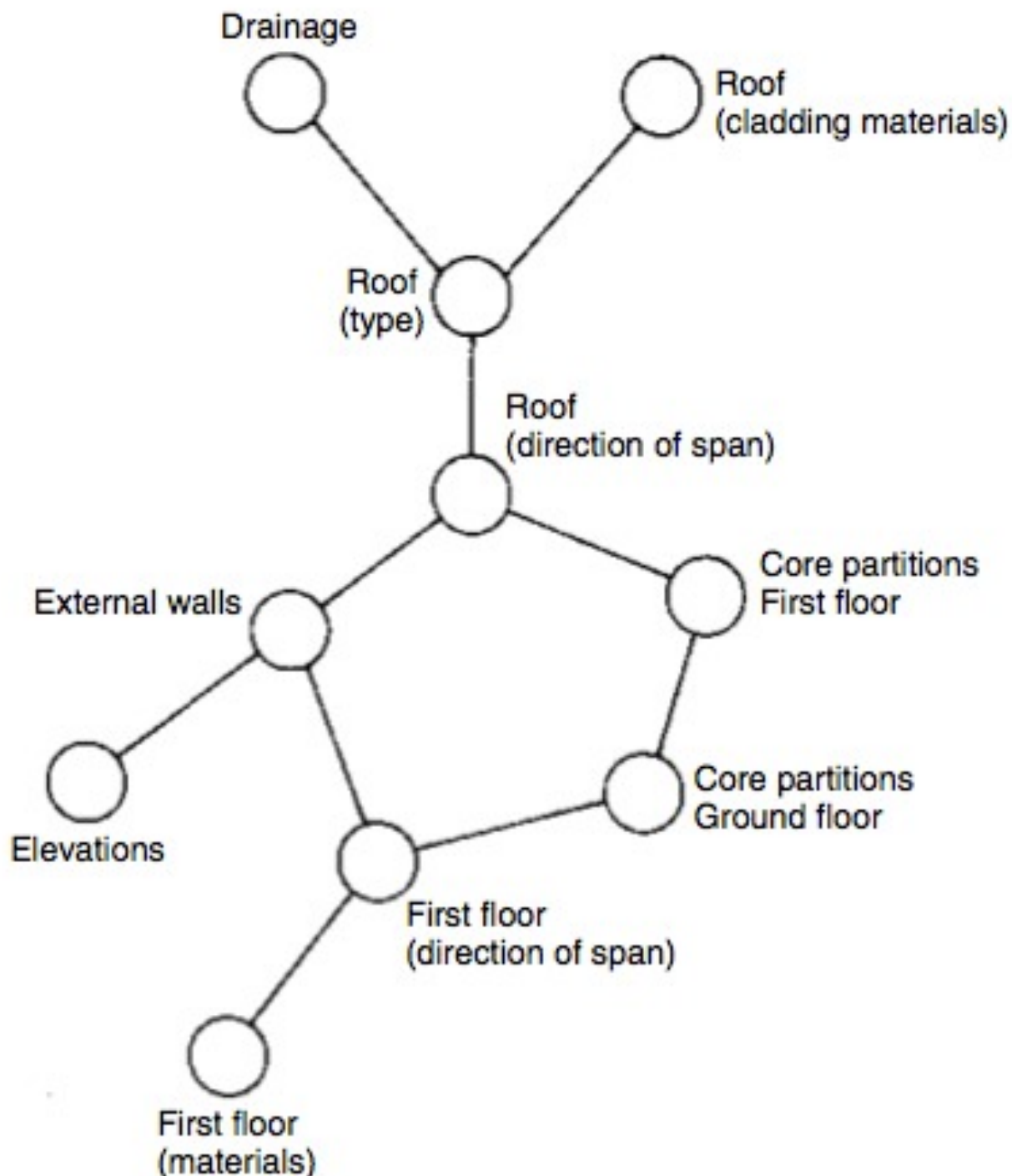


Diagram adapted from Broadbent (Wang, 2002)

MENSTRUKTURKAN MASALAH DISAIN

> **Membuat 'decision tree'** atau pohon pengambilan keputusan untuk menstrukturkan

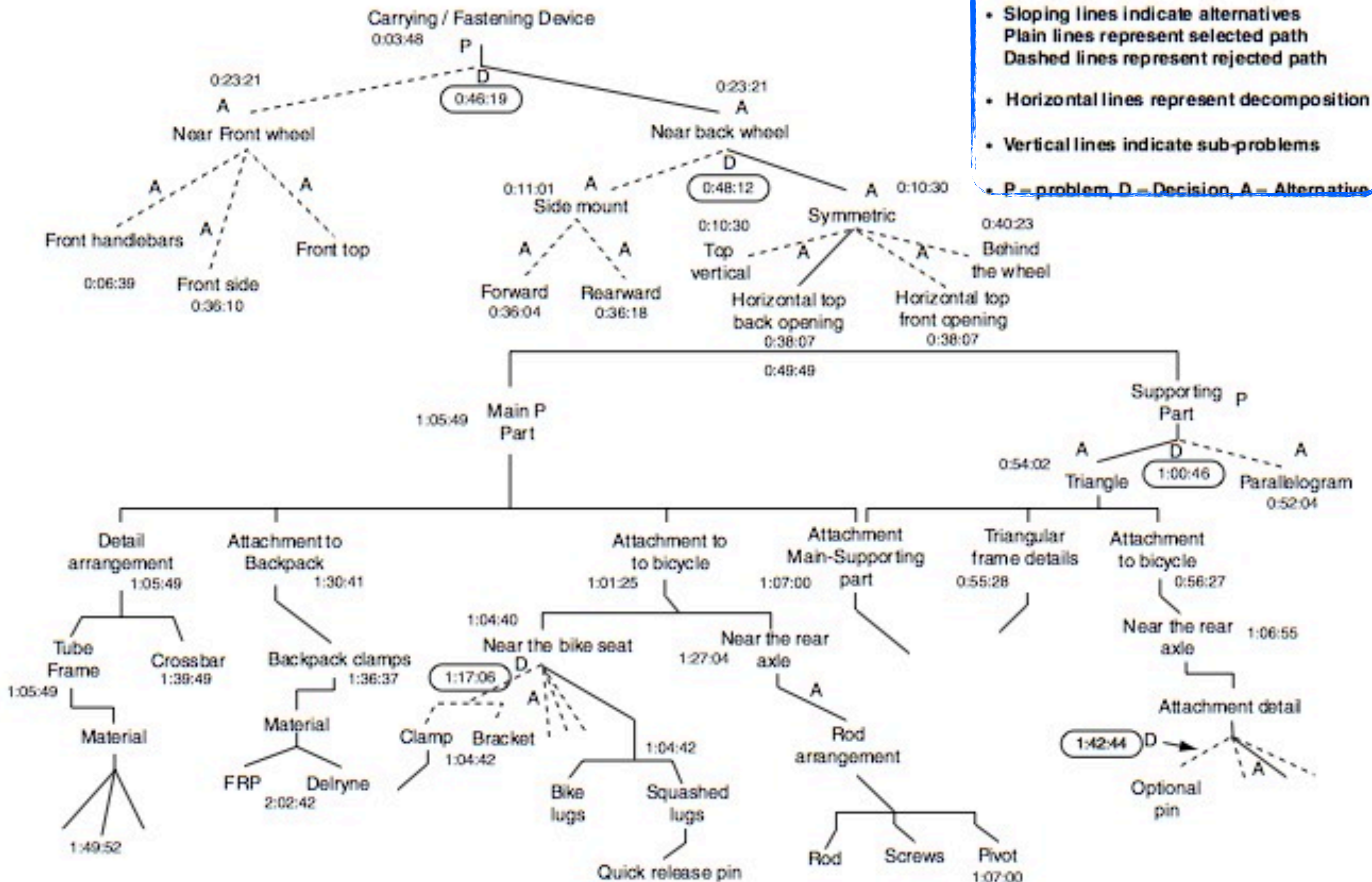
Kadang kita menemui struktur masalah yang sirkular (saling mempengaruhi): studi struktur masalah perumahan



Nigel Cross (2008) Engineering Design Methods, John Wiley&Sons, 4th edition hal. 15

Struktur pengambilan keputusan yang lebih membantu!

Nigel Cross (2008) Engineering Design Methods, John Wiley&Sons, 4th edition hal. 17



MASALAH DISAIN DAN BATASAN

> **Batasan internal (inheren)**

> **Batasan Eksternal (konteks)**

Pekerjaan Rumah:

Cari definisi / penjelasan tentang hal tersebut di
Lawson, 2007 dan referensi lainnya!

METODA DISAIN & STRUKTUR BATASAN

Modeling systems

These methods develop external connections to the design. The design does not exist by itself and these methods help place the design in context of the larger world.

Interrelationships and dependencies

These methods develop internal connections which must be developed in order to avoid running the risk that a design ends up as just a sum of its parts.

Incorporation and adaption

These methods deal with external existing structures which can be thought of as a framework or skeleton on which designers build connections. These external structures must be incorporated into the design.

Structure problems

These methods develop internal structures. A design must prioritize and weight its design elements and programs in order to create a framework on which to build.

Lidy, 2006

DISAIN / RISET SEBAGAI PENYELESAIAN MASALAH

DESIGN/RESEARCH AS PROBLEM SOLVING

Architectural research covers **many different fields**. It includes material and environmental science, study of the occupation and use of buildings, management, architectural history and theory, and design. Each of these fields is approached through separate disciplinary traditions ... It is therefore not possible to say that architectural research is a discipline in its own right. It incorporates many disciplines.

The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning, *Evaluation of Swedish Architectural Research 1995*
- 2005, Stockholm, 2006.

However, architectural research does have a single subject that is the environments that human beings create for themselves. What is unusual and possibly unique about architectural research is that to study this single subject it draws together disciplinary modes that are generally kept apart and treated separately. Architectural research is distinctive for its integration. ...

This is both strength, and a weakness.

Christopher Frayling, 1993 'Research into Art and Design'

Design research can be categorized in three ways:

research 'for' design is that concerned with applications, for example into materials and energy, and with the application of knowledge from other disciplines such as environmental psychology, ecology or sociology;

research 'into' design might include investigations into histories and theories of architecture, landscape architecture or spatial planning, or into design methods;

research 'through' design describes work where the procedure of design itself constitutes the methodology through which knowledge or insights are obtained. It is this third area of research 'through' design that has been contentious.

PARADIGMA DISAIN DAN KAITANNYA DENGAN MASALAH DISAIN

design as
rational problem solving

problem decomposition

design as search, solving (sub) problems

integrating partial solutions to whole
solutions

quantifiable methods are preferred
compared to qualitative methods. a
sound theoretical background, but does
not sound familiar to an
architect;

see Dorst 1997 diambil dari Henri Achten, Design methods and design theory for architectural design
management, ADMS selected work 2003-2007.

design as reflective practice

architect continuously
decomposes the problem but each time
different as the need occurs (naming)

sets up a (sub)-design problem (framing)

creates a partial solution (moving) checks
whether the result is moving in the right
direction (evaluating).

weak theoretical background, but sounds
much more true to an architect

POSISI DISAIN-PENELITIAN DAN KAITANNYA DENGAN MASALAH

Design Method

Research Method

Context of Design

General

Analysis & Synthesis

Qualitative & Quantitative

Identify insight, generate idea

Validation -proofing knowledge

Solve design questions

Answer research questions

Designers, users

Researchers, subjects

Groat & Wang, 2002

both scientific methods?

VARIASI METODA DISAIN

Desain sebagai analisis dan evaluasi

Programming: usaha yang dilakukan untuk memperbanyak informasi sehingga muncul konsep figuratif yang merespon pada sebanyak mungkin kriteria.

POE: usaha untuk mereduksi “black hole” dengan mengevaluasi hasil sebuah perancangan

> bagian awal dan akhir jelas, bagian tengah yaitu perancangan itu sendiri tetap tidak jelas

Desain sebagai penelitian aksi

Kajian yang mempelajari situasi yang konkrit terutama pada faktor-faktor logis yang berhubungan satu dengan yang lain dalam situasi itu yang menuju pada satu tujuan empirik tertentu melalui proses siklikal: *diagnosing, action planning, action taking, evaluating, specifying*

> bagian perancangan lebih terungkap dengan proses yang iteratif

Desain sebagai ketrampilan yang dipelajari

Desain sebagai sebuah usaha belajar dari pengalaman praktik (bukan spekulatif).

Brian Lawson: **generator** (pihak yang memotivasi perancangan) - **function** (simbolis, formal, praktikal, radikal) dan **domain** (internal, eksternal). Jane

Darke: **generator - conjecture - analysis**. Desain sebagai proses yang mengintegrasikan “cluster of requirements” menjadi solusi yang *integrated*.

> bagian perancangan terungkap melalui proses yang dipraktikkan

Desain sebagai langkah kolaborasi

Arsitek sebagai kultivator, bukan sebagai teknisi murni ataupun seniman murni tetapi lebih sebagai pihak yang sensitif terhadap ‘misi dari komunitas’

> bagian perancangan adalah proses kolaboratif dan partisipatif.

Groat & Wang, 2002

RANAH METODA DISAIN

Analysis Method

Method of data decomposition
i.e., Task analysis, Cluster analysis

Method of interpretation
i.e., Semantic differential,
Product semantic

Method of system analysis
i.e., Technical transformation system

Method of object classification
i.e., Object oriented analysis

Synthesis Method

Method of idea generation
i.e., Mind mapping

Method of decision making
i.e., Design Rational

Method of co-design
i.e., Scenario Based Design,
Participatory Design

Method of reusing design knowledge
i.e., Pattern Language

Method of realizing design
i.e., Prototyping and Simulation

Groat & Wang, 2002

VARIASI METODA DISAIN/RISET

Disain dan Penelitian Sejarah

Disain dan Penelitian Kualitatif

Disain dan Penelitian Eksperimental

Disain dan Penelitian Korelasional

Disain dan Argumentasi Logis

Studi Kasus dan Pendekatan Nekametoda
dalam Penelitian

Groat & Wang, 2002